BEFORE THE BOARD OF ENVIRONMENTAL REVIEW
OF THE STATE OF MONTANA

In the matter of the amendment of ARM 17.30.716 pertaining to categories of activities that cause non-significant changes in water quality	NOTICE OF AMENDMENT (WATER QUALITY)

TO: All Concerned Persons

1. On June 26, 2003, the Board of Environmental Review published MAR Notice No. 17-192 regarding a notice of public hearing on the proposed amendment of the above-stated rule at page 1233, 2003 Montana Administrative Register, issue number 12.

2. The Board has amended the rule as proposed, but with the following changes:

17.30.716 CATEGORIES OF ACTIVITIES THAT CAUSE NON-SIGNIFICANT CHANGES IN WATER QUALITY (1) through (5)(g) remain as proposed.

(6) The department may determine that the categorical exclusion in (2) does not apply to lots within a specific geographic area. This determination must be based upon information submitted in a petition demonstrating that the categorical exclusions should not apply within that area.

(a) A petition submitted under this rule may be considered only if it is submitted by a local governing body, a local department or board of health, a local water quality district, or by either 10% or 20, whichever is fewer, of the landowners (or persons with a contract interest in land) within the affected geographic area.

(b) A petition submitted under this rule must contain the following information:

(i) a legal description of the petition area, which is the geographic area within which the categorical exclusions would not apply;

(ii) a detailed description of the soils, geology, and hydrogeology of the area described in (6)(b)(i);

(iii) a current listing from a title insurance company of the names and addresses of all persons who either own or have a contract interest in land within the petition area; and

(iv) data from groundwater samples taken from wells that withdraw water from the uppermost aquifer underlying the petition area or from wells that withdraw water from the uppermost aquifer underlying an area within the same or adjacent county with similar climatic, soil, geologic, and hydrogeologic conditions and a density of individual sewage systems similar to that allowed in (2)(b). The groundwater data must demonstrate that one of the following conditions is met:

(A) nitrate as nitrogen concentrations exceed 5.0 mg/L in groundwater samples from more than 25% of at least 30 wells that are not located within a standard mixing zone, as defined in ARM 17.30.517(1)(d)(viii), for a septic system; or

(B) data from groundwater samples collected at least three years apart from the same 15 wells indicate a statistically significant increase of greater than 1.0 mg/L in nitrate as nitrogen concentrations in the uppermost aquifer.

(c) Within 90 days after receipt of the information required in (6)(b), the department shall issue a preliminary decision as to whether the petitioner has satisfied the requirements in (6)(b), and describe the reasons for either granting or denying the petition. The preliminary decision must be mailed to the petitioner and to all landowners or persons with a contract interest in land within the petition area and must include the following information:

(i) a description of the petition area;

(ii) a summary of the basis for the preliminary decision including any modifications to the boundaries of the petition area;

(iii) a description of the procedures for public participation and of the opportunity to comment prior to the department's final decision on the petition;

(iv) the ending dates of the comment period and the address where comments will be received;

(v) procedures for requesting a hearing; and

(vi) the name and telephone number of a person to contact for additional information.

(d) Within 60 days after the close of the public comment period, the department shall issue a final decision and provide written notice of its decision to the petitioner and to each person who submitted written comments. The final decision must set forth the department's reasons for granting or denying the petition and must include a response to all substantive comments received by the department during the public comment period or during any hearing.

3. The following comments were received and appear with the Board's responses:

COMMENT NO. 1: Protecting ground water resources and especially Flathead Lake is of major importance. More supervision not less is needed. The comment strongly recommends rejection of the proposed amendments.

RESPONSE: The proposed rule amendments are protective of health and water quality. The proposed requirements for pressure-dosed drainfields and prescriptive setbacks are more stringent than the current rule. The current rule has a single setback distance from surface water of 300 feet. The proposed rule has several different setback distances of 200, 400, 500 and 1,000 feet. Three of the four proposed setbacks are greater than the current setback. The shortest proposed setback, 200 feet, also includes a requirement for pressure dosing that is not required under the current rule. Pressure

dosing provides better treatment than gravity-dosed systems. In addition, the proposed rule requires pressure dosing under several other circumstances depending on the soil type and the specific exemption in proposed (2)(b). The current rule does not include any requirements for pressure-dosing.

The proposed rule has reduced some of the soil thickness and depth to ground water/bedrock requirements as compared to the current rule. However, since the majority of effluent treatment occurs in the shallow section of the soil column, these modifications are relatively minor and are offset by the increased setback and/or pressure dosing requirements.

The proposed rules will reduce the amount of time that review staff spend on subdivisions that do not pose a threat to health or the environment, and allow them to spend more time reviewing subdivisions where there may be health or environmental impacts.

COMMENT NO. 2: Developers should not be the ones determining the propriety of new septic tanks, because they are the ones who stand to profit. Non-degradation rules are important for ensuring water quality. Public health and water quality should be more important now than ever due to the excessive developing that is taking place in our neighborhoods. The public hearing process is an important part of ensuring safety in our community.

RESPONSE: The proposed rule was initially developed by a committee of Department employees, and then was revised over a series of three meetings with stakeholders from across the state. The stakeholders group included county officials, consultants, realtors, and environmental groups. No single entity or group was able to overly influence the contents of the proposed amendments. The petition process, based on that in the current rule, will be retained in the final amendments.

COMMENT NO. 3: The 3 mg/L threshold for nitrate concentration in the proposed amendments is far below the United States Environmental Protection Agency's (EPA's) recommended human health limit of 10 mg/L. This low threshold likely will pose problems for development in Billings, especially in the West Billings Area, a segment that is expanding rapidly. A 2002 report conducted by the Montana Bureau of Mines and Geology found an average nitrate concentration of 3.3 mg/L from 130 samples, with 18% of the samples ranging between 5 mg/L and 10 mg/L. With the Board's 3 mg/L threshold, much of the development in the West Billings Area may not meet the requirements for nonsignificance. The report also found that septic systems contribute only 10 to 20% of nitrate concentration in the ground water. Soil organic matter, agricultural fertilizers, and animal manure constitute the remaining percentage. Not only does the report illustrate that the Board's 3 mg/L threshold is unreasonable, it illustrates that septic system effluence is not always the primary cause of nitrate concentration in ground water. The

Board should reevaluate its nitrate concentration threshold of 3 mg/L, opting for a model that allows for a range of concentration and is flexible enough to take into account unique local conditions.

RESPONSE: Note that based on other public comments (see Response to Comment No. 12), the Board will modify the proposed 3 mg/L concentration to 2 mg/L, which is the level in the current rules. The 2 mg/L value in (2)(a)(vii) is an appropriate threshold for this rule based on recent studies by the USGS that indicate nitrate concentrations above 2 mg/L are indicative of anthropogenic effects. 2 mg/L is 40% of the allowable nondegradation limit of 5 mg/L for conventional septic systems (septic tank and drainfield).

If the background concentration is over 2 mg/L, the result is not that the site is deemed to cause degradation, but only that the site cannot qualify for one of the categorical exclusions in this rule, so that the applicant will need to demonstrate nonsignificance using the standard nitrogen dilution equation and the phosphorus breakthrough calculations. If background nitrate in an area is elevated above 2 mg/L, the nitrate dilution equation provides a more flexible approach to account for local conditions, and thereby to meet the nondegradation requirements.

The source of elevated nitrate in ground water, whether from septic systems, manure, agricultural practices, or natural sources, is not accounted for in the rule because the health and environmental effects of nitrate are the same regardless of the source.

COMMENT NO. 4: DEQ is displaying favoritism towards new technologies such as pressure-dosed septic systems over traditional gravity flow septic systems. If installed properly, gravity flow septic systems are suitable for soils endemic to the Billings area. Favoritism towards new technologies will drive up housing prices in Billings. Gravity flow septic systems cost considerably less than the pressure-dosed septic systems (approximately $3,000 and $4,500, respectively). Increased housing costs further perpetuate the problem of attainable housing in our area, which can dampen economic development. Again, DEQ should be more sensitive to unique local conditions, not to mention the impact rigid rules can have on the quality of life in a community.

RESPONSE: Pressure dosing is not considered a new technology. It is well established that pressure dosing provides better distribution of effluent in the drainfield and provides contact with more soil, resulting in better overall treatment of effluent compared with gravity dosing.

The proposed amendments recognize that pressure dosing may not be necessary in every location, and do not require it for every site that uses the exemptions. Two of the exemptions, (2)(b)(i) and (2)(b)(iv), do not require pressure dosing unless the soil is outside the range of the better

soils for effluent treatment. See (2)(a)(ii) of the proposed amendments for a description of those soil types and percolation rates.

An applicant may elect to avoid pressure dosing by not using the exemptions, instead using the nitrate dilution and phosphorus breakthrough equations to satisfy the nondegradation requirements. If a site is determined to be nonsignificant under those methods, there is no requirement under the nondegradation or mixing zone rules for pressure dosing, although pressure dosing may still be required under some site conditions pursuant to the DEQ subdivision rules or Department Circular DEQ-4.

COMMENT NO. 5: The regulations are written in a fashion that is hard for the layperson to understand. Regulations should be written in a straightforward manner so that the business people affected spend as little time as possible away from their businesses to comply. DEQ should make available in print or online a user-friendly compliance brochure. Moreover, in the interests of participatory government, the Board should reinstate the citizen petition process.

RESPONSE: After the rule is finalized, the Department plans to prepare and distribute a summary table of the rules with the intent of making it easier for the regulated community to understand and comply with the rule requirements.

The petition process, based on that in the current rule, will be retained in the final amendments. The petition process from the old rule has been simplified from a two-step to a one-step procedure. The percentage of landowners required for initiation of a petition has been reduced from 25% to 10%.

COMMENT NO. 6: The state seems unwilling to consider the many proven, efficient, biofilter advanced on-site systems. Two very high performance biofilter systems have proven to operate extremely well in climates such as ours; the Waterloo Biofilter System and the Waterloo Nitrex R. These systems are working well and providing residents of most other states with a proven alternative to the inefficient traditional septic and drainfield systems forced on the residents of Montana.

The narrowing of choices only makes it easier for small, low income communities to be taken advantage of by developers and real estate investors who use this regulatory quagmire to force rural communities into expensive and unnecessary centralized collection and treatment facilities.

RESPONSE: The proposed amendments do not address the issue discussed in the comment, which relates to the state standards for design of on-site wastewater systems. The standards for such systems are contained in Department Circular DEQ-4, which is not being amended at this time. It should be noted, however, that DEQ-4 does allow use of treatment systems such as the two systems mentioned in the comment under the "Experimental System" chapter.

COMMENT NO. 7: A commentor opposes the proposed amendments, and requests that DEQ perform research, particularly in growth areas in Montana, to scientifically support its assertion that septic systems pose no threat to groundwater and can be considered non-significant. DEQ has not maintained exact records regarding those systems that have been determined to be non-significant. DEQ must do additional work to ensure that it meets the requirements of 75-5-303(1), MCA: "Existing uses of state waters and the level of water quality necessary to protect those uses must be maintained and protected." Until DEQ can scientifically state that approved systems have had non-significant impacts to groundwater, it is premature and imprudent to approve these amendments. The proposed regulations also ignore the very important consequences of cumulative effects.

RESPONSE: Properly installed and maintained sewage treatment systems will provide adequate treatment and prevent significant impacts to health and the environment. A 2002 report by the United States Environmental Protection Agency (EPA) finds that public health and environmental risks from properly sited, designed, constructed, and operated septic tank systems are low. The EPA report indicates that individual septic systems may not be the best choice for high-density areas, but the proposed exemptions address this issue by requiring at least two-acre lots for most of the categories. Although that there is no universally accepted definition of "high-density" development, it is generally considered to be greater than one single-family home per acre. Section (2)(b)(iii) allows lots as small as one acre, but has strict requirements for depths to bedrock and ground water (over 100 feet), pressure dosing (required for all soil types), and the number of lots (limited to subdivisions of five lots or fewer). Section (2)(b)(iv) does not have a lot size limit, but this exemption only applies to rural counties that do not typically experience areas of high-density development.

The comment appears to request that the Department monitor ground water beneath previously approved wastewater treatment systems that have been approved under the current rule. Based on results of published reports and a 2002 EPA report, properly sited and installed septic systems provide adequate treatment to protect human health and the environment as long as the density of those systems remains at an acceptable level. Published reports indicate that a density of less than one system per acre is typically adequate to avoid significant impacts to the environment. Therefore, it is not necessary for the Department to collect additional information.

The Department requirement for a recent ground water nitrate test for every new subdivision provides additional assurances that previously approved and constructed subdivisions have not caused significant degradation of the ground water.

The proposed exemptions minimize the possibility of cumulative effects. See Response to Comment No. 15.

COMMENT NO. 8: Scientific literature establishes a causal relationship between septic system effluent discharge and water contamination throughout the United States and other parts of the world. The "non-significant" descriptor in the proposed amendments is inappropriate. In fact, sewage effluent, which contains bacteria, viruses, and chemicals, is frequently injected via septic systems into the ground in areas that are totally reliant on groundwater as a sole source of drinking water. Surface water in areas recharged from groundwater subject to the influence of upgradient septic systems is also at high risk of contamination. These ubiquitous and well documented cases are hardly nonsignificant.

RESPONSE: The proposed exemptions are written under the authority of 75-5-301(5)(c), MCA, which requires the Board to establish criteria for activities that cause nonsignificant changes in water quality. This statute requires the Board to equate significance with the potential harm to human health, a beneficial use, or the environment, taking into consideration the quantity and strength of the pollutant, the length of time degradation will occur, and the pollutant character. It is clear from the statute that the term "nonsignificant" does not mean absolutely no impact. The statutes and rules recognize that anthropogenic activities will create impacts to the environment, and the nondegradation rules are designed to mitigate those impacts, not to eliminate impacts entirely.

As stated in Response to Comment No. 7, properly sited and maintained septic systems present a low risk to public health and the environment (EPA, 2002). In 2002, the Department revised the rules for sewage systems in subdivisions and the sewage system design circular, DEQ-4, to ensure that sewage systems are designed correctly and sited in appropriate locations.

COMMENT NO. 9: According to 75-5-303(1), MCA, "Existing uses of state waters and the level of water quality necessary to protect those uses must be maintained and protected". Isn't this a main purpose for the existence of Montana's DEQ?

RESPONSE: The proposed rules meet the requirements of the referenced statute.

COMMENT NO. 10: Proposed (2)(a)(i) states: "The drainfield must be 1,000 feet or more (400 feet or more for lots that meet the criteria in (2)(b)(iv) from the nearest ... state surface water that might be impacted." This language is a significant improvement over the current rule and is more protective of surface water bodies, except it becomes a moot point by the newly proposed second part of the rule "this distance may be reduced by 50% (to 500 and 200 feet, respectively) if the drainfield is pressure-dosed". Pressure

dosing is an improvement over regular drainfield lines that rely on gravity flow. However, the effluent flowing into the subsurface soils beneath the drainfield is the same effluent leaving a non-pressurized drainfield, especially as the drainfield reaches its lifetime and will need replacement. Leave the first part of the rule and omit the second.

RESPONSE: The reduction in setbacks in the second part of this exemption is provided to encourage the use of pressure-dosed drainfields. Pressure-dosed drainfields provide better treatment of effluent than gravity dosed drainfields and have a longer life expectancy. A 2002 report by EPA concluded that: "Dosed-flow distribution systems are a significant improvement over gravity-flow distribution systems... Dosing achieves better distribution of the wastewater effluent over the infiltration surface than gravity flow systems and provides intervals between doses when no wastewater is applied. As a result, dosed-flow systems reduce the rate of soil clogging, more effectively maintain unsaturated conditions in the subsoil..." The setback reduction for pressure-dosed systems is justified given the better treatment capability of those systems.

COMMENT NO. 11: Proposed (2)(a)(ii)(A) states: "the soil percolation rate must be between 16 and 50 minutes per inch". Soil percolation tests are subject to too many variables to be considered an adequate test of soil treatment suitability. In addition, percolation tests are carried out at land surface and they are generally not verified by DEQ personnel. Treatment fields are at one to five feet below land surface and soils can significantly change within the soil profile. "Perc" tests are not a good scientific indication of soil suitability for treatment and should be eliminated from testing requirements and replaced with appropriate soil pit texturing and tests by professionals.

RESPONSE: Section (2)(a)(ii) has two subsections, (A) and (B), both of which must be satisfied to meet this exemption. Section (B) requires at least six feet of the specified soil type. By requiring a specific soil type, the proposed rule already requires what the comment requests. Including the requirement in (A), for a percolation test value, is a supplement to the criteria for a soil description in (B). Percolation values are only required by the proposed amendments when a percolation test has been required separately under Department Circular DEQ-4.

COMMENT NO. 12: Proposed ARM 17.30.716(2)(a)(vii) states: "The background nitrate (as N) concentration in the shallowest groundwater must be less than three mg/L". The current regulations have a rather complicated system of assessment regarding application of background nitrate values to proposed downgradient use, and a requirement of 3 mg/L is an improvement over the current complex rating system. It is also more protective of groundwater resources than the current limits of 5 and 7.5 mg/L in certain cases. However, if a

background nitrate concentration can be historically shown to be significantly less than 3 mg/L nitrate (say 1 mg/L or less), then impacts to groundwater have already occurred. If the only change in activity in the area upgradient to an area proposed for development and subsequent future installation of septic systems is subdivision and housing, then it is reasonable to say that degradation of groundwater quality has occurred and will continue to occur and most likely will increase in the receiving waters. This is not protective of groundwater and the rule should be changed to accommodate those areas that have historical nitrate concentrations less than 3 mg/L. It is inappropriate to allow possible catastrophic development of an area based on a nitrate background value that reflects a "snapshot" in time. The trend in nitrate concentration is much more important than the value at any given time. The regulations should be modified to require trend analysis where data are available.

RESPONSE: The comment is correct in that a nitrate concentration of less than 3 mg/L does not guarantee that there have been no anthropogenic impacts to the groundwater. In the few cases where adequate historic data are available to identify an increasing trend in nitrate concentrations, the Department can use that information to deny an exemption based on the proposed language in (5)(a). The exemption can be denied even if the background nitrate concentration is less than the maximum limit in the proposed rule. Proposed (5)(a) allows the Department to use cumulative impacts or synergistic effects to require review of the site using the standard nitrate dilution and the phosphorus breakthrough analyses. Therefore, adding an additional rule section requiring trend analysis is not necessary.

The 3 mg/L concentration in proposed (2)(a)(vii) is the nitrate concentration that indicates the groundwater has been impacted by anthropogenic activities according to a 1985 USGS study. However, based on public comments the Department has determined that more recent USGS studies published in 1996 and 2000 indicate that the anthropogenic impacted concentration is lower at 2 mg/L. Based on those more recent studies, the Department will modify the proposed value of 3 mg/L to 2 mg/L, which is the same value as in the current rule.

COMMENT NO. 13: Proposed (2)(a)(vii)(A) states: "The department may require multiple groundwater samples over a specified time period to determine whether seasonable variation of ground water nitrate concentrations may affect compliance with this requirement." The "may" should be changed to "shall." Seasonal variation appears to have an effect on the level of nitrate concentrations, but this phenomenon is not well understood nor has it been studied or well documented in the literature. Given Montana's current drought situation, this will be especially important later when we return to a wetter cycle as water tables rise and those chemical values in soil beneath drainfields are moved into the saturated zone and carried into groundwater to either a receiving well or surface

waters.

RESPONSE: Requiring seasonal data for each site is not necessary. There are many areas in the state where seasonal variation of nitrate ground water concentrations does not occur to any noticeable degree. To require all areas to collect seasonal data, which may take up to 12 months to complete, would create an unreasonable delay in processing applications and would not provide useful information in many cases. The current language allows the Department discretion to request additional information in areas where the data will be useful.

COMMENT NO. 14: In proposed (2)(b)(i)(D) and (2)(b)(ii)(E) the limitations on depth to bedrock and uppermost aquifer are significantly reduced compared to the current rule, by as much as 92%. How can this be considered more protective of groundwater? Bedrock aquifers are more susceptible to contamination from surface and subsurface sources because of the nature of flow within the fractured systems. Once contamination reaches groundwater in bedrock systems, it can travel rapidly in fractures without dilution or further treatment. Keeping the requirements as they are currently written is the more protective of the two statutes.

RESPONSE: The 92% value cited in the comment is somewhat misleading because it compares the separation requirement for one-acre and larger lots in the current rule (100 feet) to the separation requirement for two-acre and larger lots in proposed rule sections (2)(b)(i)(D) and (2)(b)(ii)(E) (8 or 12 feet respectively). For one-acre and larger lots the proposed rule maintains the 100-foot separation requirement that is in the current rule for one-acre lots.

For two-acre and larger lots, the proposed amendments reduce the separation to bedrock/aquifer from 50 feet in the current rule to either 8 or 12 feet. The reasoning behind this reduction is that the majority of effluent treatment occurs in the upper several feet of the soil column (except for phosphorus) because this is where the majority of organic material resides. According to a 2002 EPA report: "Biochemical oxygen demand, suspended solids, fecal indicators and surfactants are effectively removed within 2 to 5 feet of unsaturated, aerobic soil..." With lot sizes greater than two acres, the 8 to 12 feet of separation is adequate. The much greater separation for the one acre lots (100 feet) is included to avoid impacts from cumulative effects.

Cumulative effects of the larger lots (over two acres) will not create significant nitrogen or phosphorus degradation due to the rule restrictions on soil type, surface water setbacks, pressure dosing requirements, and based on the relatively low density provided by the two-acre limit. Based on existing national research, areas of significant nitrogen ground water degradation that are due to septic systems are typically associated with high density development, with "high density" generally being greater than one home per acre.

COMMENT NO. 15: These rules promote development at the cost of groundwater degradation. Cumulative effects, which are cursorily addressed in proposed ARM 17.30.716(5)(a), should be the major concern of DEQ. An appropriate analogy is the "death of a thousand cuts". Each additional septic system only slightly increases the impact to groundwater, but eventually, with enough development and enough time, the groundwater is rendered not potable. Previously approved and developed subdivisions may have had septic system installations that were far enough apart, in appropriate soils, with adequate depth to the underlying aquifer, so that impacts from septic systems were mitigated. However, if those subdivisions are surrounded by additional subdivisions with additional septic system effluent loading, the cumulative effects will occur over time and groundwater will be contaminated by human sewage. DEQ must effectively address this issue or many households will eventually lose their sole source of drinking water.

RESPONSE: The proposed rules minimize the possibility of cumulative effects in several ways. First, only two of the exemptions allow less than a two-acre lot size. Based on published studies, low-density development (density of less than one home per acre) decreases the chances of cumulative impact problems. Section (2)(b)(iv) does not have a lot size limit, but this exemption is only applicable to counties with very low growth rates where cumulative impacts are not a problem. Section (2)(b)(iii) is an exemption for lots one acre and larger, but due to the restrictive requirements in this section (including limiting it to subdivisions of five lots or less) it is not anticipated that this exemption will create cumulative impact problems. Second, the proposed rule requires that the background nitrate be less than 2 mg/L (see Response to Comment No. 12). This requirement will limit use of the exemptions in areas where a nitrate ground water problem is developing. Third, (5)(a) allows the Department to deny use of an exemption if the Department believes cumulative effects will cause a problem. Finally, the petition process allows local citizens and local government to alert the Department to a local problem that the Department may not be aware of in reviewing an application.

COMMENT NO. 16: The reasons for the amendments are nebulous and subject to question. What is the problem of having to meet more complex requirements if it is more protective of groundwater?

RESPONSE: One of the primary benefits of the proposed amendments is that it will reduce the time to review those nonsignificance applications that do not pose a threat to health or the environment. By reducing the review time for such sites, Department personnel will have more time for reviewing developments that may have significant health or environmental impacts.

COMMENT NO. 17: DEQ has not maintained exact records regarding those systems that have been determined to be non-significant. Has DEQ in fact looked at the systems it has approved to determine if they have caused water quality degradation? If so, where are those records and why aren't they published and part of the public record? DEQ needs to go back and do more homework on those systems they have approved and look at specific areas of the state that are experiencing growth rates with the commensurate septic system installations and take a hard look at groundwater quality in those areas, both over time and with fluctuating aquifer levels. Until that information is available and DEQ has more scientific evidence to show that septic systems in these situations are non-significant, they have no legitimate reason for changing the current rules.

RESPONSE: See Response to Comment No. 7.

COMMENT NO. 18: Evidence in the Helena area based on 1460 data points over a 31-year period shows consistent and ongoing degradation of groundwater. The only land use that has changed in that period is subdivision growth, with septic systems, in areas that were formerly prairie or agricultural properties. This is not a unique situation for Montana and assessments should be done across the state before rules are changed that are less protective of a resource that cannot be easily replaced.

RESPONSE: The change in nitrate concentration contours may be due to the increase in the number of wells available to sample in 2000 as compared to 1970. Areas of elevated nitrate concentration may have existed in 1970 but not recognized until additional wells were constructed after 1970. Increases of nitrogen in ground water may also be linked to the amount of nitrogen-based fertilizer used for agricultural purposes. According to a 1995 USGS report, nitrogen fertilizer use in the U.S. has increased by 20% between 1970 and 1995. While the agricultural land in the valley may have been reduced between 1970 and 2000, the amount of fertilizer applied per acre has likely increased, which could lead to localized increases of nitrate in the ground water.

The maps submitted show several areas of elevated nitrate concentrations. However, there is no indication of whether these areas of high nitrate concentration are related to subdivision growth. One area is downgradient of the former East Helena Asarco facility, which may be contributing to the elevated nitrate concentrations. Another area of elevated concentrations is located on the south side of Helena where all of the residences are connected to the city sewer system, and could not be contributing to the elevated nitrate concentration. Regardless of the source of elevated nitrate concentrations, the proposed amendments include a maximum background nitrate concentration that limits the use of the rule in areas where nitrate concentrations are greater than 2 mg/L, which addresses the issue in the comment.

In addition, see Response to Comment No. 1.

COMMENT NO. 19: The new rules would raise the background nitrate (as N) concentration from 2 mg/L to 3 mg/L in order to be exempted from nondegradation analysis. This change will contribute to the degradation of ground and surface water. In the Clark Fork Basin in western Montana, background nitrate concentration in groundwater is typically <1 mg/L; higher concentrations are usually indicative of anthropogenic effect. The USGS states that shallow ground water unaffected by human activities commonly contains less than 2 mg/L of nitrate. Additionally, nitrate concentrations greater than 2 mg/L but less than the MCL of 10 mg/L have been associated with adverse health effects. Consequently the level of 2 mg/L in the current rules should not be increased. Alternatively, the rule could provide that the level remain at 2 mg/L, but can be revised upward or downward if local governments provide sufficient credible information demonstrating that natural background levels are higher or lower in their particular jurisdiction. This would be superior to a one-size-fits-all approach.

RESPONSE: See Response to Comment No. 12 to answer the first part of this comment.

The state water quality standard for nitrate is 10 mg/L. The Board must base its rules and determinations on those concentrations regardless of the results of the studies cited.

The petition process, which will be reinserted, with amendments, in the rule, addresses the comment in the second paragraph. If a county agency does not believe that the exemptions should be used for a particular location and the agency can demonstrate compliance with the petition process requirements, the agency can use the petition process to require the development to demonstrate nonsignificance using the nitrate dilution model and the phosphorus breakthrough calculations, thereby disallowing the use of the exemptions.

COMMENT NO. 20: A determination of nonsignificance is highly dependent on the soil profile, thus it is critical that site evaluations are conducted by a certified or licensed professional, such as a certified sanitarian. Montana, unlike neighboring states such as Idaho and Wyoming, does not currently require certification or licensing of site evaluators, but doing so would help ensure consistency and quality in nondegradation analyses. In EPA's Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems (EPA 832-B-03-00l, March 2003) five management models are presented, ranging in scope from homeowner awareness to management entity ownership. All of these models recommend licensing or certification of site evaluators. Montana should adopt this practice for all onsite wastewater site evaluations, but in the interim, minimum qualifications for a site evaluator should be required in the amended rules.

RESPONSE: This comment is outside the scope of the proposed rule. Requirements for persons who describe soil test pits are not a part of this rule, those requirements are

in the subdivision rules. ARM 17.36.325(3)(c) states: "The locations [of test holes] must be established by a person qualified to evaluate and identify soil in accordance with ASTM standard D5921-96el (Standard Practice for Subsurface Site Characterization of Test Pits for On-Site Septic Systems)."

COMMENT NO. 21: The proposed amendments do not do enough to prevent surface water degradation from cumulative impacts. The horizontal setback from surface water has been increased somewhat, but a simple horizontal setback is not necessarily protective of surface water. Nitrate discharge to groundwater that is hydrologically connected to surface water can travel long distances and have significant impact on surface waters where concentrations are typically much lower. Such discharges have already led to significant surface water degradation in the Clark Fork River. A 1999 study for the City of Missoula showed that groundwater loading from septic systems along the lower Bitterroot River contributed 320 kilograms per day of nitrogen to the Bitterroot and Clark Fork rivers. This is equal to 70% of the nitrogen contributed by the Missoula wastewater treatment plant, the single largest source of nitrogen in the Clark Fork.

While the proposed amendments state that DEQ may review an otherwise nonsignificant designation as significant if there are cumulative impacts, analysis of cumulative effects is open to staff discretion, and there is no systematic rule or approach to reviewing the impacts of septic system nitrate to surface water.

RESPONSE: For the reasons stated in Response to Comment No. 15, the proposed amendments adequately address the possibility of significant cumulative impacts. Section (5) of the proposed amendments accounts for unique circumstances where additional scrutiny of an application is required. It is not necessary to require a cumulative effects analysis for each application, but only for those situations where the site-specific conditions indicate it is necessary.

When the Department determines that a septic system may impact surface waters, there are criteria in the rules that the Department uses to determine if the impacts are significant. These criteria include an evaluation to determine if the WQB-7 trigger values for nitrate and/or phosphorus are exceeded pursuant to ARM 17.30.715(1)(c). If the trigger values are exceeded, the Department then assesses the impact with respect to the narrative criteria in ARM 17.30.715(1)(g). Typically, the Department uses a computer surface water model to determine compliance with the narrative standard. In addition, the Department is currently working on developing numeric standards for nutrients in surface waters. Numeric standards will provide the regulated community with more clarity as to what is necessary to satisfy the surface water nondegradation requirements.

COMMENT NO. 22: The Board should consider a rulemaking specifically designed to prevent degradation of surface water from nutrients from septic tanks. The commentor would be interested in participating with DEQ and other interested parties in developing such a rule. Until such a rule is in place, the present rule should be amended so that it does not apply to basins that have a recognized surface-water nutrient problem. This would include all basins where receiving streams are listed as "impaired" due to nutrients, basins that have nutrient TMDLs established or under development, and other high-quality surface waters. We particularly believe no exemption from nondegradation analysis should be allowed in the Clark Fork Basin for onsite systems in alluvial aquifers with flow toward surface water, given the well-documented nutrient impairments in this basin.

RESPONSE: With regards to the need to develop rules for cumulative impacts analysis, see Response to Comment No. 21.

Prohibiting use of exemptions in impaired basins would add complexity to the rule without adding any additional protection to those basins. To bar use of exemptions in an impaired basin would restrict areas of land that are remote from the impaired surface water, which would not result in additional protection for the surface water, since natural denitrification of effluent is more likely to occur as the effluent travels longer distances to its discharge point. For lots close to an impaired surface water, such as the Clark Fork River, the river alluvial material often has a high hydraulic conductivity, which makes it relatively easy to meet the nitrate concentration limits in the nitrate dilution equation at the end of a 100-foot mixing zone. In addition, to meet the 50-year phosphorus breakthrough requirement, a 100-foot wide single-family drainfield (100 feet is a common width for a single family drainfield) has to be only 200 feet (or shorter if the depth to a limiting layer is greater than four feet) from the surface water. The proposed exemptions require a minimum distance from the drainfield to surface water of 500 or 1,000 feet for areas with any significant population growth (generally the western 1/3 of the state), which is greater than the 100 or 200-foot separation that can be allowed under the nitrate dilution and phosphorus breakthrough methods. In many situations the exemptions are more protective than the nitrogen and phosphorus calculations, and therefore there is no need to limit use of the exemptions in impaired basins.

COMMENT NO. 23: These amendments should not represent the last word in this process. The Department and the Board should continue to look for more opportunities to address the inadequacies of the current dilution model.

RESPONSE: The Department is continuing its research into methods to update the dilution model. At this time, other states that use analytical models to determine nitrogen impacts use models and assumptions similar to those used in Montana. The information that is needed to make the dilution

model more accurate, which is related to the amount of natural denitrification that occurs beneath a drainfield, is typically site-specific and requires significant resources in time and money to acquire. The Department allows the use of a site-specific denitrification factor, but due to the resources required applicants have not successfully used this approach in the past.

COMMENT NO. 24: The proposed rules should not use nation-wide USGS data for determining what the non-anthropogenic affected (i.e. natural background) nitrate ground water concentration is in Montana. DEQ should allow each individual county in Montana to determine what the natural background is for use in proposed (2)(a)(vii).

RESPONSE: While there may be some differences in natural background nitrate concentrations between counties, the differences are not significant enough to justify the time and financial resources necessary to establish different values for each county. However, should any county wish to conduct such research or pursue more stringent rulemaking, the DEQ review process would honor that effort.

COMMENT NO. 25: The value for nitrate concentration in proposed (2)(a)(vii) should be set at 2 mg/L instead of 3 mg/L because a 1996 USGS report indicates the value is 2 mg/L.

RESPONSE: See Response to Comment No. 12.

COMMENT NO. 26: Soil pit descriptions are too subjective. The Department should provide a more standardized system that includes minimum standards for persons who submit soil pit descriptions to the Department.

RESPONSE: See Response to Comment No. 20.

COMMENT NO. 27: Maintain the petition process in the current rule in the proposed rule.

RESPONSE: The petition process, based on that in the current rule, will be retained in the final amendments. See Responses to Comment Nos. 5 and 29.

COMMENT NO. 28: In (5) of the proposed amendments, change the word "may" to "shall" or "must" to require the Department to assess the impacts of cumulative effects as listed in proposed (5)(a) for every lot that uses one of the exemptions in the proposed amendments.

RESPONSE: For the reasons stated in Response to Comment No. 15, the proposed amendments adequately address the possibility of cumulative impacts. Section (5) will allow the Department to address unique circumstances where additional scrutiny of an application is required. It is not necessary to require a cumulative effects analysis for each application, but only for cases in which site-specific conditions indicate it is necessary.

COMMENT NO. 29: Maintain the petition process in the current rule, but make it easier to use by reducing the percent of local landowners necessary to request a petition.

RESPONSE: The petition process, based on that in the current rule, will be retained in the final amendments. The petition process from the old rule has been simplified from a two-step to a one-step procedure. The percentage of landowners required for initiation of a petition has been reduced from 25% to 10%.

COMMENT NO. 30: The value for nitrate concentration in (2)(a)(vii) should be set at the same value as in the current rule, 2 mg/L.

RESPONSE: See Response to Comment No. 12.

Reviewed by: BOARD OF ENVIRONMENTAL REVIEW

_____ By: _____

JAMES M. MADDEN
Rule Reviewer

JOSEPH W. RUSSELL, M.P.H.
Chairman

Certified to the Secretary of State, _____, 2003.